



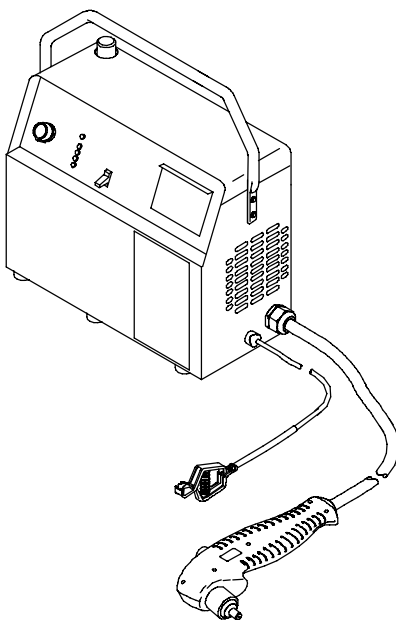
**Miller**®

May 1997

Form: OM-182 702

Effective With Serial No. KG198345

# OWNER'S MANUAL



## **Spectrum® 300 (50/60 Hz)** For Plasma Arc Cutting (PAC)

Rated Cutting Output	Amperes Input at Rated Output, 50 Hz, Single-Phase	KVA	KW	Plasma Gas	Plasma Gas Flow/ Pressure	Max OCV
	230 V					
25 A @ 89 Volts DC At 35% Duty Cycle	17 (0.2*)	4.0 (0.05*)	3.1 (0.04*)	Air Or Nitrogen Only	4.5 CFM (129 L/min) At 60 PSI (414 kPa)	265 Volts DC

\*While idling



# SECTION 1 – SAFETY FOR PLASMA ARC CUTTING

OM-182 702 –  
5/97

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## 1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ Marks a special safety message.

☞ Means NOTE; not safety related.



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

## 1-2. Plasma Arc Cutting Hazards

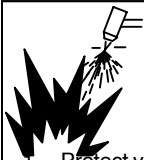


### WARNING

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.



#### CUTTING can cause fire or explosion.

Hot metal and sparks blow out from the cutting arc. The flying sparks and hot metal, hot workpiece, and hot equipment can cause fires and burns. Check and be sure the area is safe before doing any cutting.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not cut where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the cutting arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that sparks and hot materials from cutting can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that cutting on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.

7. Do not cut on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the cutting area as practical to prevent cutting current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Never cut containers with potentially flammable materials inside – they must be emptied and properly cleaned first.
10. Do not cut in atmospheres containing explosive dust or vapors.
11. Do not cut pressurized cylinders, pipes, or vessels.
12. Do not cut containers that have held combustibles.
13. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
14. Do not locate unit on or over combustible surfaces.
15. Remove any combustibles, such as a butane lighter or matches, from your person before doing any cutting.

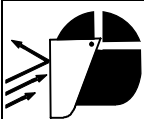


#### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The torch and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. Plasma arc cutting requires higher voltages than welding to start and maintain the arc (200 to 400 volts dc are common), but also uses torches designed with safety interlock systems which turn off the machine when the shield cup is loosened or if tip touches electrode inside the nozzle. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
4. Do not touch torch parts if in contact with the work or ground.
5. Turn off power before checking, cleaning, or changing torch parts.
6. Disconnect input power before installing or servicing this equipment. Lockout/tagout input power according to OSHA CFR 1910.147 (see Safety Standards).
7. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.

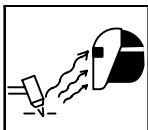
8. Check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet – always verify the supply ground.
9. When making input connections, attach proper grounding conductor first.
10. Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
11. Turn off all equipment when not in use.
12. Inspect and replace any worn or damaged torch cable leads.
13. Do not wrap torch cable around your body.
14. Ground the workpiece to a good electrical (earth) ground if required by codes.
15. Use only well-maintained equipment. Repair or replace damaged parts at once.
16. Wear a safety harness if working above floor level.
17. Keep all panels and covers securely in place.
18. Do not bypass or try to defeat the safety interlock systems.
19. Use only torch(es) specified in Owner's Manual.
20. Keep away from torch tip and pilot arc when trigger is pressed.
21. Clamp work cable with good metal-to-metal contact to workpiece (not piece that will fall away) or worktable as near the cut as practical.



#### FLYING SPARKS AND HOT METAL can cause injury.

Sparks and hot metal blow out from the cutting arc. Chipping and grinding cause flying metal.

1. Wear approved face shield or safety goggles with side shields.
2. Wear proper body protection to protect skin.
3. Wear flame-resistant ear plugs or ear muffs to prevent sparks from entering ears.



### ARC RAYS can burn eyes and skin.

Arc rays from the cutting process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

1. Wear face protection (helmet or shield) with correct shade of filter to protect your face and eyes when cutting or watching. ANSI Z49.1 (see Safety Standards) suggests a No. 9 shade (with No. 8 as minimum) for all cutting currents less than 300 amperes. Z49.1 adds that lighter filter shades may be used when the arc is hidden by the workpiece. As this is normally the case with low current cutting, the shades suggested in Table 1 are provided for the operator's convenience.
2. Wear approved safety glasses with side shields.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.





### NOISE can damage hearing.

Prolonged noise from some cutting applications can damage hearing if levels exceed limits specified by OSHA (see Safety Standards).

5. Use approved ear plugs or ear muffs if noise level is high.
6. Warn others nearby about noise hazard.

**Table 1. Eye Protection For Plasma Arc Cutting**

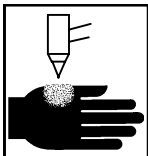
Current Level In Amperes		Minimum Shade Number
Below 20		#4
20 – 40		#5
40 – 60		#6
60 – 80		#8



### FUMES AND GASES can be hazardous to your health.

Cutting produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

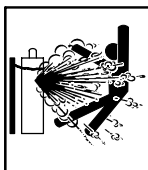
1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove cutting fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals to be cut, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Fumes from cutting and oxygen depletion can alter air quality causing injury or death. Be sure the breathing air is safe.
6. Do not cut in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not cut on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the cutting area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes when cut.
8. Do not cut containers with toxic or reactive materials inside or containers that have held toxic or reactive materials – they must be emptied and properly cleaned first.



### PLASMA ARC can cause injury.

The heat from the plasma arc can cause serious burns. The force of the arc adds greatly to the burn hazard. The intensely hot and powerful arc can quickly cut through gloves and tissue.

1. Keep away from the torch tip.
2. Do not grip material near the cutting path.
3. The pilot arc can cause burns – keep away from torch tip when trigger is pressed.
4. Wear proper flame-retardant clothing covering all exposed body areas.
5. Point torch away from your body and toward work when pressing the torch trigger – pilot arc comes on immediately.
6. Turn off power source and disconnect input power before disassembling torch or changing torch parts.
7. Use only torch(es) specified in the Owner's Manual.



### CYLINDERS can explode if damaged.

Gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of metalworking processes, be sure to treat them carefully.

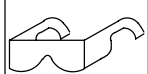
1. Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flame, sparks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any cutting or other electrical circuits.
4. Never allow electrical contact between a plasma arc torch and a cylinder.
5. Never cut on a pressurized cylinder – explosion will result.
6. Use only correct gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
7. Turn face away from valve outlet when opening cylinder valve.
8. Keep protective cap in place over valve except when cylinder is in use or connected for use.
9. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

## 1-3. Additional Installation, Operation, And Maintenance Hazards



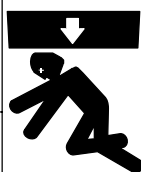
### HOT PARTS can cause severe burns.

1. Do not touch hot parts bare handed.
2. Allow cooling period before working on torch.




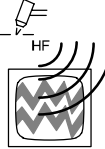


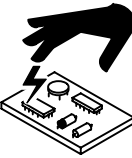

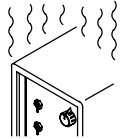
### FLYING PIECES OF METAL or DIRT can injure eyes.

1. Wear safety glasses with side shields or face shield.



### FALLING EQUIPMENT can cause serious personal injury and equipment damage.

1. Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
2. Use equipment of adequate capacity to lift unit.
3. If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

	<p><b>FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.</b></p> <ol style="list-style-type: none"> <li>1. Do not locate unit on, over, or near combustible surfaces.</li> <li>2. Do not install unit near flammables.</li> </ol>		<p><b>HIGH-FREQUENCY RADIATION can interfere with radio navigation, safety services, computers, and communications equipment.</b></p> <ol style="list-style-type: none"> <li>1. Have only qualified persons familiar with electronic equipment perform this installation.</li> <li>2. The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.</li> <li>3. If notified by the FCC about interference, stop using the equipment at once.</li> <li>4. Have the installation regularly checked and maintained.</li> <li>5. Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.</li> </ol>
	<p><b>MOVING PARTS can cause injury.</b></p> <ol style="list-style-type: none"> <li>1. Keep away from moving parts such as fans.</li> <li>2. Keep all doors, panels, covers, and guards closed and securely in place.</li> </ol>		<p><b>MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.</b></p> <ol style="list-style-type: none"> <li>1. Pacemaker wearers keep away.</li> <li>2. Wearers should consult their doctor before going near plasma arc cutting operations.</li> </ol>
	<p><b>STATIC ELECTRICITY can damage parts on circuit boards.</b></p> <ol style="list-style-type: none"> <li>1. Put on grounded wrist strap BEFORE handling boards or parts.</li> <li>2. Use proper static-proof bags and boxes to store, move, or ship PC boards.</li> </ol>		<p><b>SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.</b></p> <ol style="list-style-type: none"> <li>1. Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.</li> </ol>
	<p><b>OVERUSE can cause OVERHEATED EQUIPMENT.</b></p> <ol style="list-style-type: none"> <li>1. Allow cooling period.</li> <li>2. Reduce amperage (thickness) or reduce duty cycle before starting to cut again.</li> <li>3. Follow rated duty cycle.</li> </ol>		

## 1-4. Principal Safety Standards

<p><i>Safety in Welding and Cutting</i>, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126</p> <p><i>Safety and Health Standards</i>, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.</p> <p><i>Recommended Practices for Plasma Arc Cutting</i>, American Welding Society Standard AWS C5.2, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126</p> <p><i>Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances</i>, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126</p>	<p><i>National Electrical Code</i>, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.</p> <p><i>Safe Handling of Compressed Gases in Cylinders</i>, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.</p> <p><i>Code for Safety in Welding and Cutting</i>, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.</p> <p><i>Safe Practices For Occupation And Educational Eye And Face Protection</i>, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.</p> <p><i>Cutting And Welding Processes</i>, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.</p>
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## 1-5. EMF Information

<p>Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields</p> <p>The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, <i>Biological Effects of Power Frequency Electric &amp; Magnetic Fields – Background Paper</i>, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): “. . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks.”</p>	<p>To reduce magnetic fields in the workplace, use the following procedures:</p> <ol style="list-style-type: none"> <li>1. Keep cables close together by twisting or taping them.</li> <li>2. Arrange cables to one side and away from the operator.</li> <li>3. Do not coil or drape cables around the body.</li> <li>4. Keep welding power source and cables as far away as practical.</li> <li>5. Connect work clamp to workpiece as close to the weld as possible.</li> </ol> <p><b>About Pacemakers:</b></p> <p>The above procedures are also recommended for pacemaker wearers. Consult your doctor for complete information.</p>
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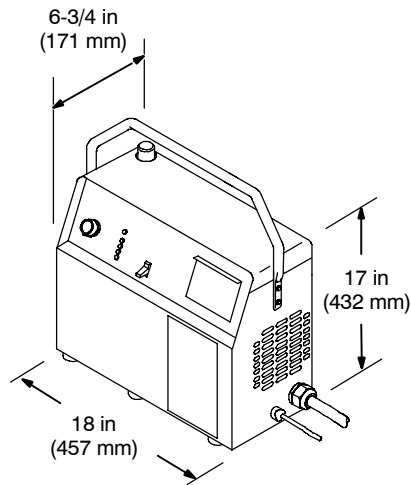
# SECTION 2 – INSTALLATION

## 2-1. Selecting A Location

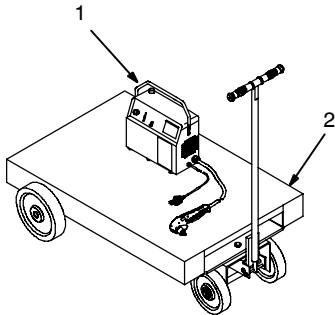


### Dimensions And Weight

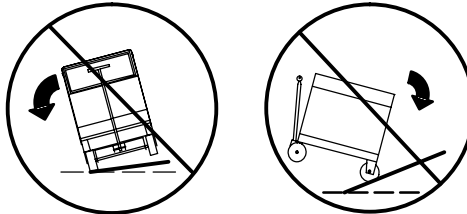
42 lb (19.1 kg)



### Movement



▲ Do not move or operate unit where it could tip.



#### 1 Lifting Handle

Use handle to lift unit.

#### 2 Hand Cart

Use cart or similar device to move unit.

#### 3 Rating Label (On Lower Right Rear Of Unit)

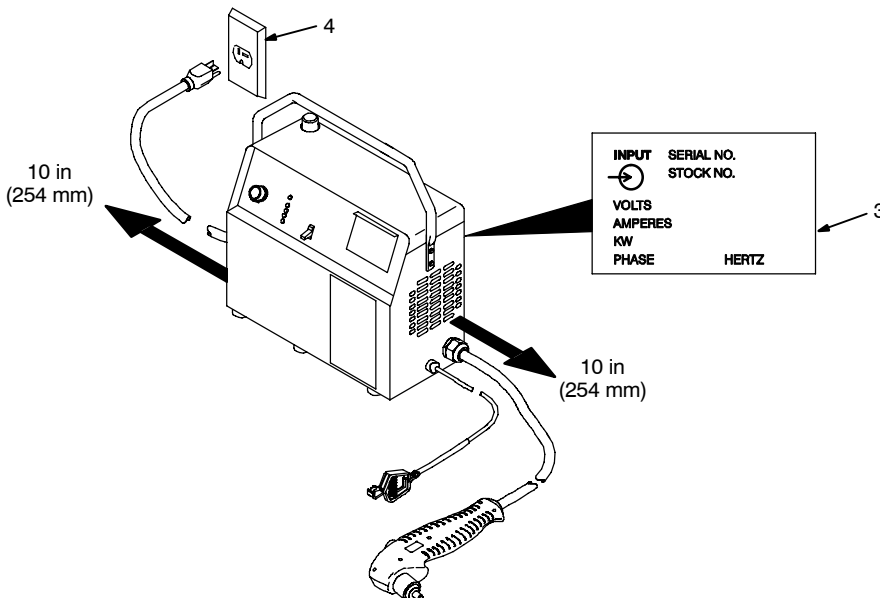
Use label to determine input power needs.

#### 4 230 VAC Receptacle

Locate unit near correct input power supply.

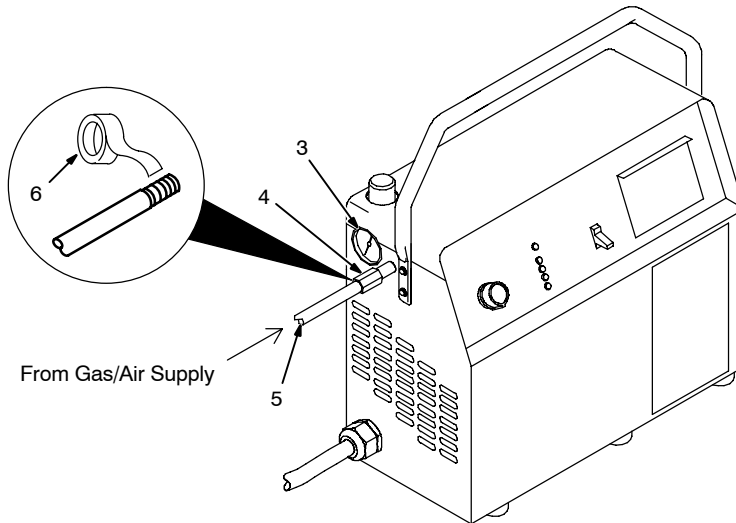
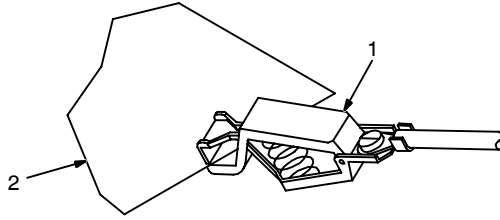
▲ Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

### Location And Airflow



loc\_2 3/96 - ST-801 646 / ST-801 647

## 2-2. Connecting Work Clamp And Gas/Air Supply




Tools Needed:

 5/8, 1-1/8 in

- 1 Work Clamp
- 2 Workpiece

Connect work clamp to a clean, paint-free location on workpiece, as close to cutting area as possible.

 Use only clean, dry air with 70 to 150 psi (483 to 1034 kPa) pressure.

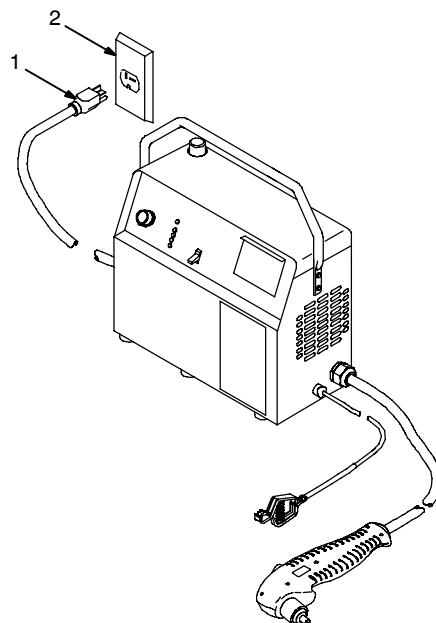
- 3 Air Filter/Regulator
- 4 Gas/Air Inlet Opening
- 5 Hose
- 6 Teflon Tape

Obtain hose with 1/4 NPT right-hand thread fitting. Wrap threads with teflon tape (optional) or apply pipe sealant, and install fitting in opening. Route hose to gas/air supply.

Adjust gas/air pressure according to Section 3-1.

Ref. ST-091 547-C / Ref. ST-801 648

## 2-3. Connecting Input Power



Tools Needed:



- 1 User-Installed 230 VAC Plug
- Install proper input power plug.

**▲ Be sure input power connection meets all applicable national, regional, and local electrical codes.**

- 2 230 VAC Receptacle

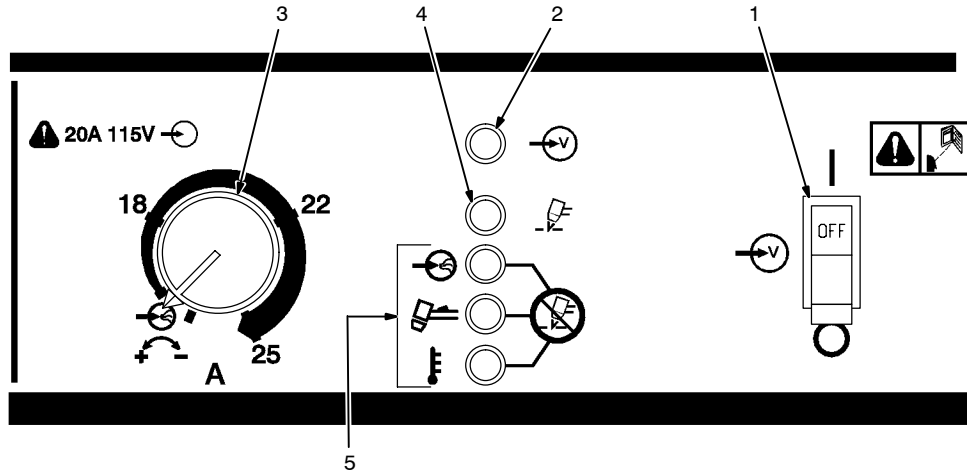
To use maximum output, an individual branch circuit capable of carrying 17 amperes, 230 VAC at 35% duty cycle, and protected by fuses or circuit breakers is required.

Connect plug to proper receptacle. Be sure receptacle can handle load.

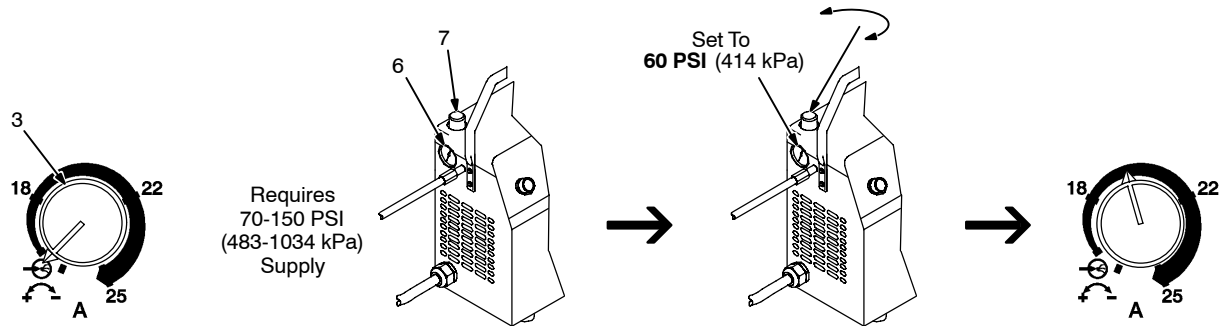
ST-801 646

# SECTION 3 – OPERATION

## 3-1. Controls



### Setting Gas/Air Pressure



1 Power Switch

2 Power Light

3 Output Control

Use control to set cutting output.

The yellow zone is for use on 20 A or greater primary circuits.

Place control in Gas/Air Set position to safely adjust gas/air pressure. Only gas/air circuit is activated.

4 Ready Light

Use light to tell if unit is ready for operation.

Ready light comes on when Power switch is placed in On position, indicating that all safety shutdown systems are okay.

If Ready light does not come on, check Trouble Lights.

5 Trouble Lights (See Section 4-2)

### Setting Gas/Air Pressure

6 Air Filter/Regulator

7 Pressure Adjustment Knob

Place Output control in Gas/Air position and turn on gas/air supply. Lift knob and turn to adjust pressure. Push knob down to lock in setting.

Place Output control in desired cutting output.



### 3-2. Symbols And Definitions

<b>A</b>	Amperes		Plasma Arc Cutting (PAC)		Adjust Air/Gas Pressure		Air Pressure
<b>V</b>	Volts		Increase		No - Do Not Do This		Temperature
	Protective Earth (Ground)		Loose Shield Cup		Input		Voltage Input
<b>I</b>	On		Off		Loose Shield Cup		

### 3-3. Duty Cycle And Overheating

**35% Duty Cycle At 25 Amperes**

→

3-1/2 Minutes Cutting

6-1/2 Minutes Resting

Duty Cycle is percentage of 10 minutes that unit can cut at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, Temperature trouble light goes On, and cooling fan runs. Wait fifteen minutes for unit to cool or Temperature light to go Off. Reduce amperage or duty cycle before cutting or gouging.

**▲ Exceeding duty cycle can damage unit and void warranty.**

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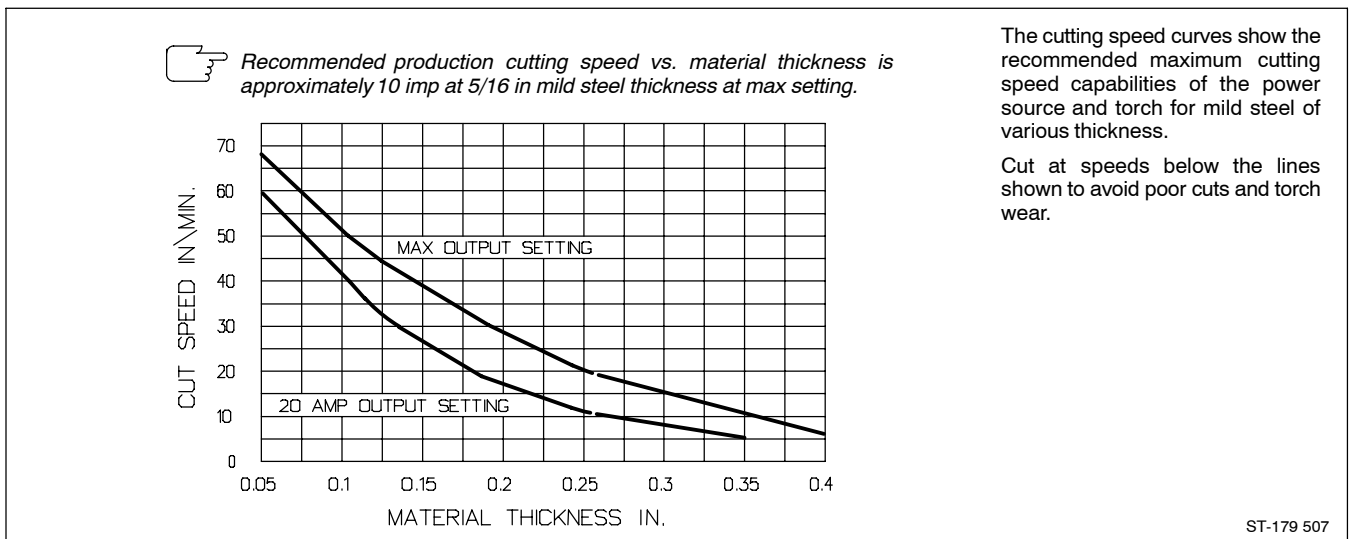
**Overheating**

0  
15  
Minutes

**A or V**  
OR  
Reduce Duty Cycle

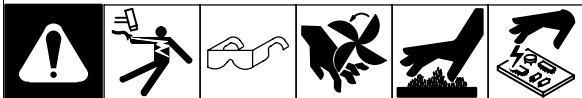



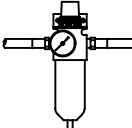
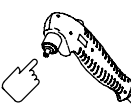





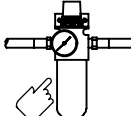
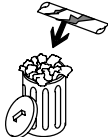
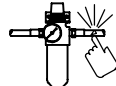
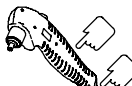


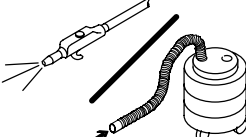
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### 3-4. Cutting Speed

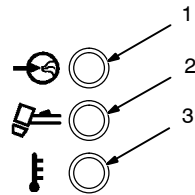
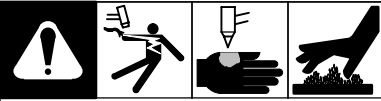


# SECTION 4 – MAINTENANCE & TROUBLESHOOTING

## 4-1. Routine Maintenance

							<b>Disconnect power before maintaining.</b>	 <i>Maintain more often during severe conditions.</i>		
<div> <b>Each Use</b></div>										
			Check Gas/Air Pressure						Check Torch Tip, Electrode, And Shield Cup	
<div> <b>Every Week</b></div>										
						Check Shield Cup Shutdown System				
<div> <b>3 Months</b></div>										
				Replace Damaged Or Unreadable Labels					Service Air Filter/Regulator	
		Replace Cracked Parts								Torch Body, Cable
						Tape Torn Outer Covering				
<div> <b>6 Months</b></div>										
						Blow Out Or Vacuum Inside				

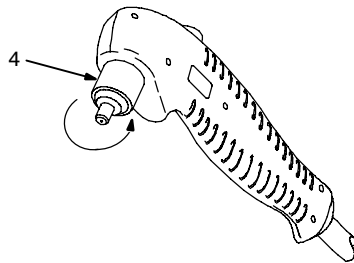
## 4-2. Overload Protection: Trouble Lights & Checking Shield Cup Shutdown System



### Checking Torch Shield Cup Shutdown System



*Power must be reset whenever the cup shutdown system is activated. **Always turn Off power when changing or checking consumables.***



If certain problems occur, the Ready light goes off, a trouble light comes on, and output stops.

#### 1 Pressure Light

Lights if gas/air pressure is below 40 PSI (276 kPa).

Turn power Off, and check for proper gas/air pressure (see Section 3-1).

#### 2 Cup Light

Lights if shield cup is loose.

Turn power Off, and check shield cup connection (see torch Owner's Manual). Power must be reset whenever the cup shutdown is activated.

Check shield cup shutdown system once a week.

#### 3 Temperature Light

Lights if power source overheats (see Section 3-3).

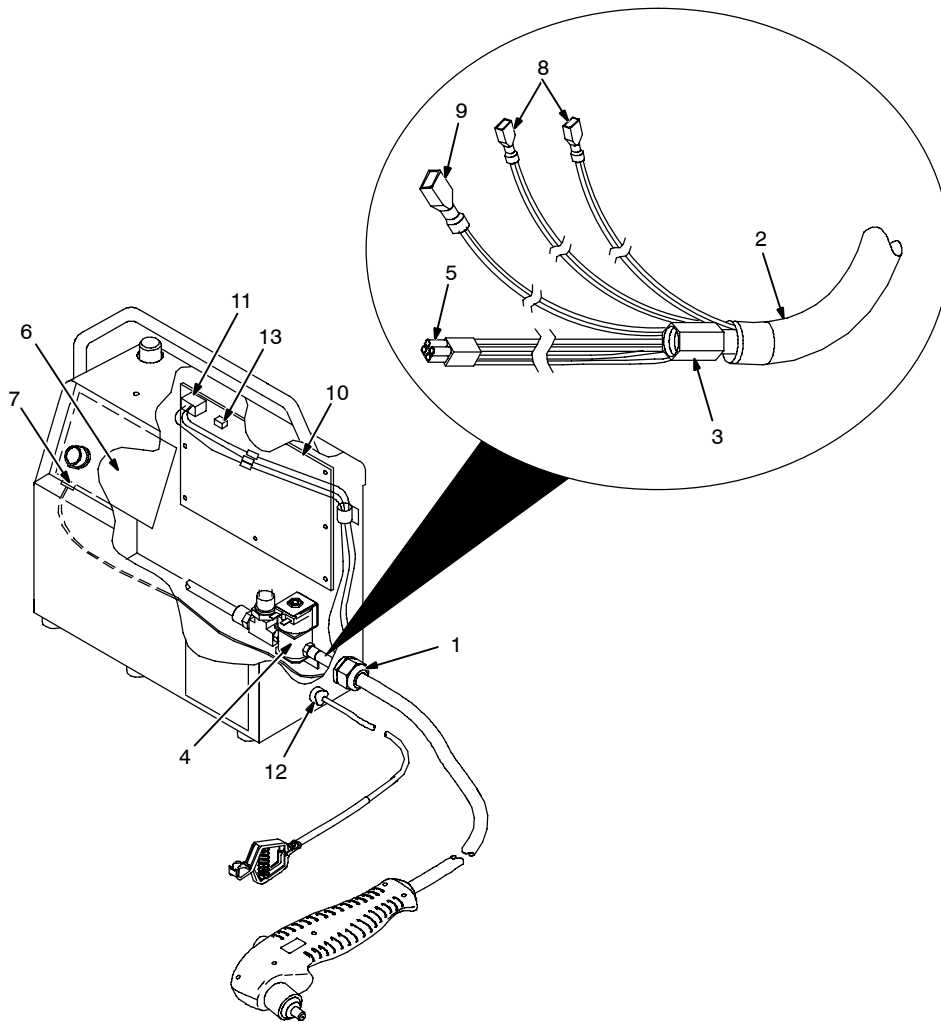
#### 4 Torch Shield Cup

Turn Power On and loosen shield cup. If shutdown system works properly, Ready light goes off and Cup light comes on. If not, turn power Off and check for proper gas/air pressure (see Section 3-1), blocked or leaking hose, or loose shield cup (see torch Owner's Manual).

If system works properly, retighten cup and reset power.

Ref. ST-181 264-A / Ref. ST-801 300-A

### 4-3. Torch And Work Cable Connections



If torch or work cable needs to be removed or replaced, proceed as follows:

Turn power Off, and disconnect input power plug from receptacle. Remove top and screws holding front panel in place. Without disconnecting any plugs, move front panel to allow access.

#### Torch Connections

1 Strain Relief Clamp

2 Torch Cable

Insert cable through strain relief clamp.

3 Gas Connector

4 Gas Valve

Install gas connector onto gas valve.

5 Plug PLG18

6 Safety Control Board PC2

7 Receptacle RC18

Connect PLG18 to RC18. Route leads along existing lead bundle.

8 Female Friction Terminals

9 Male Friction Terminal

10 Power Control Board PC1

11 Receptacle RC4

Connect female terminals to leads 23 and 24 from RC4 (connect to either lead). Connect male terminal to lead 25 from RC4. Route leads as shown.

#### Work Cable Connections

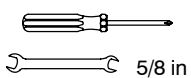
12 Strain Relief Clamp

Insert work clamp lead through strain relief clamp.

13 Receptacle RC6


Connect work clamp lead to lead 20 from RC6 (leads not shown). Route leads along existing lead bundle.

#### Tools Needed:



5/8 in

## 4-4. Troubleshooting

	
Trouble	Remedy
No pilot arc; difficulty in establishing an arc.	<p>Clean or replace worn consumables as necessary (see torch Owner's Manual).</p> <p>Check for damaged torch or torch cable (see torch Owner's Manual).</p> <p>Have Factory Authorized Service Agent check control relay CR6, power control board PC1, safety control board PC2, gas valve GS1, rectifier SR1, and check gas/air system for leaks.</p>
No cutting output; Power light off; Trouble lights off; Ready light off; fan motor FM does not run.	<p>Place Power switch in On position.</p> <p>Place line disconnect device in On position (see Section 2-3).</p> <p>Check line fuse(s) and replace if needed or reset circuit breakers (see Section 2-3).</p> <p>Have Factory Authorized Service Agent check power switch S1, input resistor R2, control relay CR6, safety control board PC2, and transformer T1.</p>
No cutting output; Power light on; Ready light on; Trouble lights off; fan motor FM running.	<p>Be sure work clamp is connected.</p> <p>Clean or replace worn consumables as necessary (see torch Owner's Manual).</p> <p>Have Factory Authorized Service Agent check contactor W, control relay CR3, and safety control board PC2.</p>
No cutting output; Power light on; Ready light off; Trouble lights off; fan motor FM running.	<p>Reset Power switch.</p> <p>Have Factory Authorized Service Agent check contactor CR7, control relay CR6, safety control board PC2, input resistor R2, power control board PC1. Check for proper torch lead connections. Check operation of gas valve GS1, and check gas/air system for leaks.</p>
No control of output.	Have Factory Authorized Service Agent check power control board PC1, and safety control board PC2.
No gas/air flow; Power light on; Ready light on; Trouble lights off; fan motor FM running.	Have Factory Authorized Service Agent check for proper torch connections, and check power control board PC1. Check operation of gas valve GS1, and check gas/air system for leaks.
Pressure Trouble light On; Ready light off.	<p>Check for correct gas/air pressure adjustment (see Section 3-1).</p> <p>Check for sufficient gas/air supply pressure (see Section 2-2).</p> <p>Check for dirty air filter/regulator and clean, if needed (see manufacturer's instructions).</p>
Cup Trouble light On; Ready light off.	<p>Check torch shield cup (see Section 4-2).</p> <p>Have Factory Authorized Service Agent check for proper torch connections, and check safety control board PC2</p>
Temperature Trouble light On; Ready light off.	<p>Thermostat TP1 open (overheating). Allow fan to run; the thermostat closes when the unit has cooled (see Section 4-2).</p> <p>Have Factory Authorized Service Agent check safety control board PC2 and transformer T1.</p>
Fan motor FM does not run; Power light and Ready light both On.	Have Factory Authorized Service Agent check fan motor connections.
Trouble lights not working.	Have Factory Authorized Service Agent check safety control board PC2.

# SECTION 5 – ELECTRICAL DIAGRAM

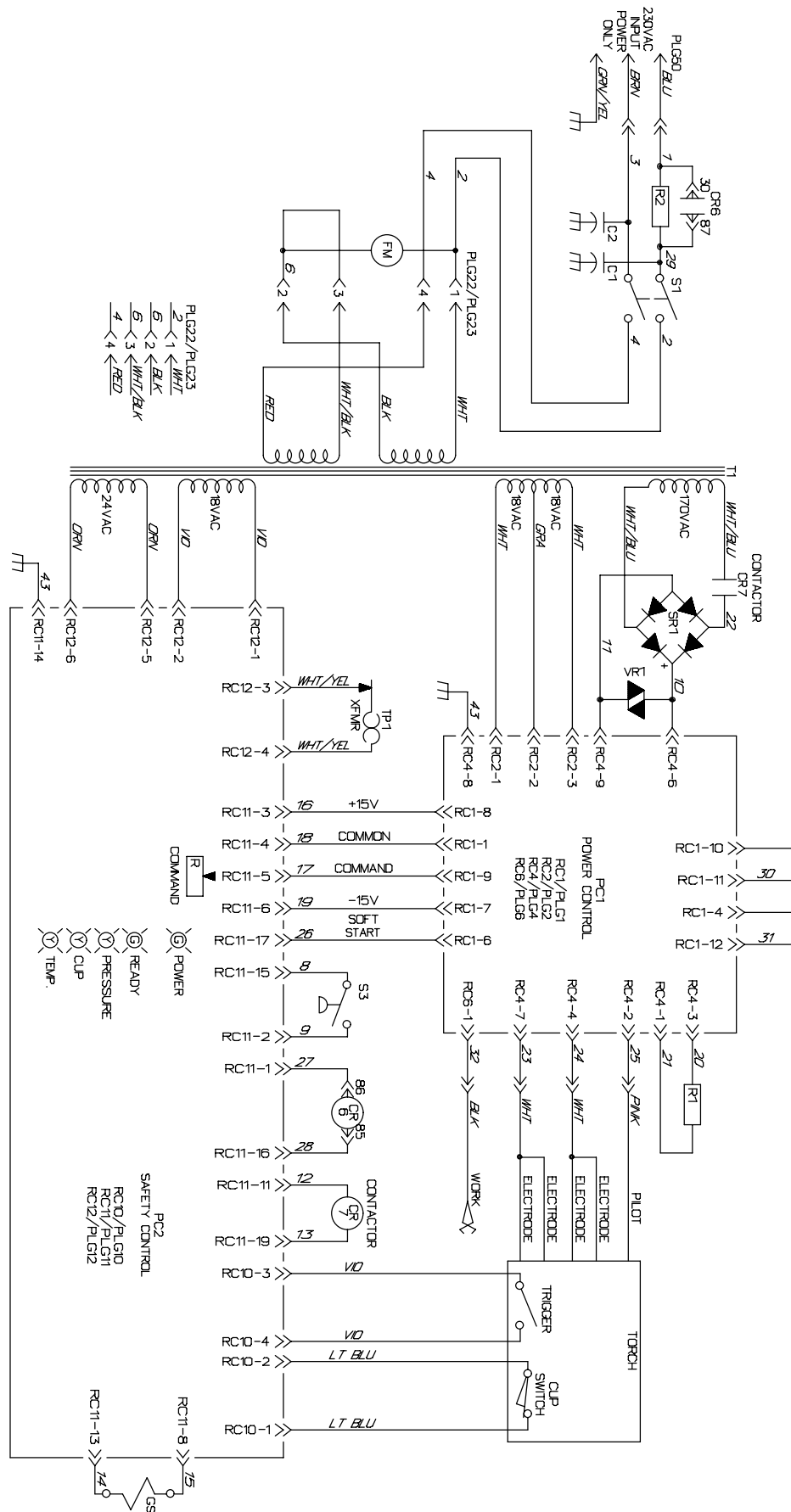


Figure 6-1. Circuit Diagram For Power Source

# NOTES

# SECTION 6 – PARTS LIST

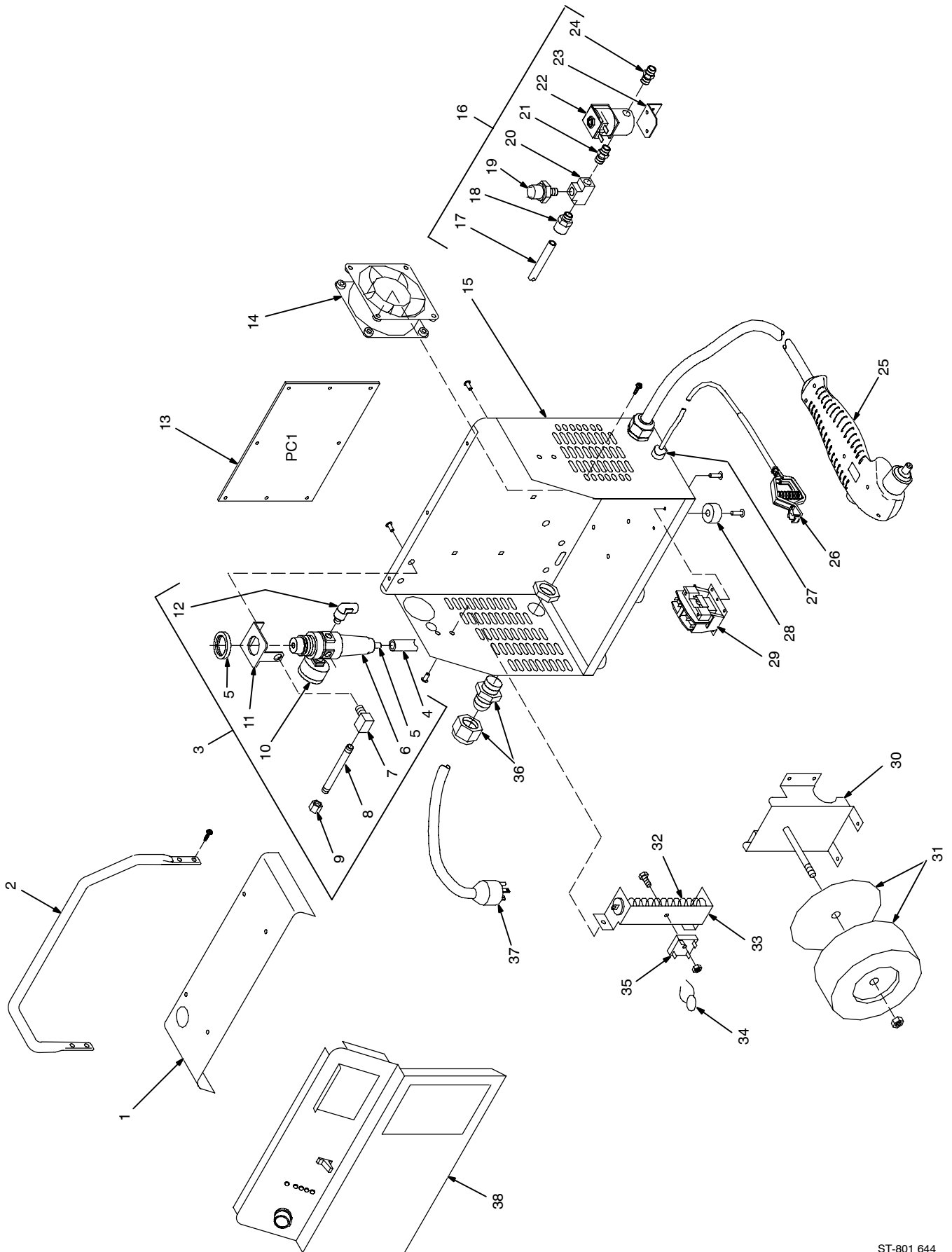


Figure 6-1. Main Assembly

ST-801 644



Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 6-1. Main Assembly</b>				
1		175 055	COVER, top	1
2		175 145	HANDLE, lifting	1
3		175 366	REGULATOR ASSEMBLY, (consisting of)	1
4		177 347	HOSE, SAE .187 ID x .410 OD x 6.500	1
5		175 999	FITTING, brs barbed fem 3/16tbg x 1/8NPT	1
6		174 668	REGULATOR/FILTER, 250 PSIG in 100 PSIG max out	1
7		176 518	FITTING, pipe brs elbow st 1/4NPT	1
8		176 517	FITTING, pipe brs nipple L 1/4NPT x 2.500	1
9		602 963	FITTING, pipe brs coupling 1/4NPT	1
		118 134	FITTING, pipe brs plug shhd 1/4NPT	1
10		174 783	GAUGE, pressure air 0-160 PSI 1/8NPT	1
11		174 562	BRACKET, mtg air filter/regulator	1
12		176 123	FITTING, plstc Qdisc elbow 1/4NPT x 1/4 OD tubing	1
		181 693	GASKET, NPRN control knob cover	1
13	PC1	184 973	CIRCUIT CARD ASSEMBLY, power control	1
	PLG1	158 720	CONNECTOR & SOCKETS	1
	PLG4	168 071	CONNECTOR & SOCKETS	1
	PLG6	176 121	CONNECTOR, rect 1 row plug	1
		134 201	STAND-OFF SUPPORT, PC card	3
		070 026	STAND-OFF, 6-32 x .437 lg	4
14	FM	088 566	MOTOR FAN, 115V 50/60 Hz 3100RPM	1
15		175 053	CASE, base/back/sides	1
16		175 365	AIR VALVE ASSEMBLY, (consisting of)	1
17		177 346	TUBING, pneumatic .250 OD x .170 ID x 13.500	1
18		176 122	FITTING, plstc Qdisc straight 1/8NPT x 1/4 OD	1
19	S3	174 670	SWITCH, pressure air 40PSI fixed	1
20		602 965	FITTING, pipe brs tee 1/8NPT	1
21		073 655	FITTING, pipe brs nipple hex 1/8NPT	1
22	GS1	175 827	VALVE, 24VAC 3 way 1/8NPT 5/32 orf 100PSI	1
23		157 057	BRACKET, valve	1
24		175 998	FITTING, pipe brs adaptor 1/8NPT/.375-24 LH	1
25		176 499	ICE-25C PLASMA ARC CUTTING TORCH, 15ft (see OM-1593)	1
25		♦176 822	ICE-25C PLASMA ARC CUTTING TORCH, 25ft (see OM-1593)	1
26	Work	186 574	CABLE WORK 15ft, (consisting of)	1
		601 222	CLAMP, univ 50A	1
		600 848	WIRE, strd 12ga 600V (order by ft)	15ft
		176 089	TUBING, plstc PVC blk .250 ID x .375 OD x 9.000	1
27		020 577	BUSHING, strain relief .120/.150 ID x .500mtg	1
28		019 663	MOUNT, nprn	6
29	CR2	175 828	CONTACTOR, def prp 25A 1P 24VAC	1
		072 253	STUD, connection	1
30		175 144	BRACKET, transformer	1
31	T1	178 062	TRANSFORMER, main power 115/230 50/60Hz	1
32	R1	176 505	RESISTOR, WW fxd 338W 1.5 ohm	1
		059 726	INSULATOR, end	2
33		175 058	BRACKET, resistor	1
34	VR1	178 393	VARIATOR	1
35	SR1	179 682	RECTIFIER, integ 40A 800V	1
		141 690	GROMMET	2
36		139 041	BUSHING, strain relief .455/.629 ID x 1.115mtg	2
37		182 521	CABLE, power 10ft 14ga 3/C	1
	FL1	181 262	FILTER, common mode 25A	1
38			FRONT PANEL, (consisting of)	1
		+181 717	PANEL, front	1
		174 991	KNOB, pointer	1
			NAMEPLATE, (order by model and serial number)	1
		159 036	LENS, LED clear	5
		159 035	CLIP, lens retainer LED	5
	S1	124 511	SWITCH, toggle DPST 40A 600VAC	1

.....	.....	181 708	.....	GASKET, switch	.....	1
Item No.	Dia. Mkgs.	Part No.		Description		Quantity

**Figure 6-1. Main Assembly (Continued)**

... 38				FRONT PANEL, (consisting of) (Continued)		
.....	CR7	149 823	.....	RELAY, encl 12VDC SPST		1
.....	R2	182 486	.....	THERMISTOR, PTC 8A 250V		1
.....	C1,2	178 981	.....	CAPACITOR,		1
.....		178 956	.....	MAGNET, adhesive mounted		1
.....		183 805	.....	LABEL, warning precautionary		1
.....		179 190	.....	LABEL, warning shock		1
.....	PLG20,22	167 640	.....	CONNECTOR & SOCKETS		1
.....	PC2	183 712	.....	CIRCUIT CARD ASSEMBLY, safety control		1
.....	PLG11	169 240	.....	CONNECTOR & SOCKETS		1
.....		176 478	..	STAND-OFF SUPPORT, PC card		4
.....		178 595	..	CONSUMABLE STORAGE BOX, (consisting of)		1
.....		178 593	.....	PARTITION		1
.....		178 792	.....	DOOR, storage box		1
.....		176 655	..	ELECTRODE, 25A		3
.....		176 656	..	TIP, 25A		3

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

◆ Optional

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.



Effective January 1, 1997  
(Equipment with a serial number preface of "KH" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

**LIMITED WARRANTY** – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. **THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.**

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
  - \* Original main power rectifiers
  - \* Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
  - \* Transformer/Rectifier Power Sources
  - \* Plasma Arc Cutting Power Sources
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Inverter Power Supplies
  - \* Intellitig
  - \* Robots
  - \* Engine Driven Welding Generators  
(NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
  - \* Motor Driven Guns (w/exception of Spoolmate 185)
  - \* Process Controllers
  - \* Positioners and Controllers
  - \* Automatic Motion Devices
  - \* Orbital Weld Heads
  - \* IHPS Power Sources
  - \* Water Coolant Systems
  - \* HF Units
  - \* Grids
  - \* Spot Welders
  - \* Load Banks
  - \* SDX Transformers
  - \* Miller Cyclomatic Equipment
  - \* Running Gear/Trailers
  - \* Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
  - \* Deutz Engines (outside North America)
  - \* Field Options  
(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
  - \* MIG Guns/TIG Torches

- \* APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- \* Remote Controls
- \* Accessory Kits
- \* Replacement Parts (No labor)
- \* Spoolmate 185

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

### Warranty Questions?

Call  
1-800-4-A-MILLER  
for your local  
Miller distributor.





# Owner's Record

**Please complete and retain with your personal records.**

**Model Name**

**Serial/Style Number**

**Purchase Date**

(Date which equipment was delivered to original customer.)

**Distributor**

**Address**

**City**

**State**

**Zip**



## Resources Available

**Always provide Model Name and Serial/Style Number.**

**Contact your Distributor for:**

To locate distributor nearest you call  
1-800-4-A-Miller

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Owner's Manuals

Technical Manuals (Servicing Information  
and Parts)

Circuit Diagrams

Welding Process Handbooks

**Contact the Delivering Carrier for:**

For assistance in filing or settling claims,  
contact your distributor and/or equipment  
manufacturer's Transportation Department.

File a claim for loss or damage during  
shipment.

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**International Headquarters—USA**

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